

INSTRUCTIONS

SINA-Z zirconia blocks are a high-performance ceramic used for machining customised restorations such as crowns, bridges, abutments, bars, superstructures or implant bridges.

CAUTION

Before removing a block from its package, please read this user's manual carefully. It contains important information on the processing of ceramic blocks for the safety of your co-workers and yourself, as well as the safety of patients.

When **SINA-Z** zirconia blocks are being milled, dust enters the air. This dust can cause irritation of the eyes and skin as well as damage to the lungs if it is inhaled. Therefore, please make sure that your milling machine's dust vacuum system is always operating properly. Wear protective glasses and a dust mask.



HANDLING

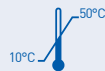
SINA-Z zirconia blocks are delivered in a pre-sintered state. So they still do not possess the final properties of the dental restorations. As with all ceramic materials, please be particularly careful in the stages of the work.

Be sure to closely inspect the delivery after receiving it to ensure:

- Undamaged packaging
- Product integrity (no cracks, no colour variation).

Storage of the SINA-Z blocks:

- In the original packaging.
- In a dry place.
- At a temperature between 10 °C and 50 °C.



When you use the SINA-Z blocks, be sure that they are not:

- Exposed to vibrations or impacts.
- Manipulated with wet hands.
- In contact with fluids (such as water or glues, for example).
- Contaminated.



If all of the items mentioned in this user's manual are not complied with, the **SINA-Z** blocks must not be used for manufacturing dental restorations.

RECOMMENDATIONS FOR DENTISTS

1) Preparation:

In addition to a quality material for the dental prosthesis, professional preparation and processing are essential. You can achieve maximum patient safety and satisfaction by observing the following recommendations:

- Preparation of a fillet or a rounded corner
- 1.5 - 2 mm of minimum occlusal reduction
- Curvature radius: 0.7mm
- Angle of preparation: 6° - 8°
- There should be no assemblies with more than 2 attachments for the posterior teeth.

Gluing the assembly can be achieved with some classic phosphate or glass ionomer cement. In case of bruxism, one should decide if a ceramic restoration is indicated (risk of breakage of the cosmetic ceramic).

2) Working with the zirconia:

See the General Precautions paragraph below.

Dental restorations will need to be cleaned and sterilised according to current procedures. Sterilisation using an autoclave is not recommended (risk of embrittlement of the zirconia in the long term).

It is preferable to use chemical sterilisation or an effective disinfection with chlorhexidine, for example.

RECOMMENDATIONS FOR DENTAL TECHNICIANS

During the design of the restauration, keep the following minimal values:

- Wall thickness for anterior tooth: 0.4 mm
- Wall thickness for posterior tooth: 0.6 mm
- Wall thickness for trans-screwed unit: 0.6 mm
- Minimal section surface area of the interconnection between 2 adjacent anterior teeth: 6 mm²
- Minimal section surface area of the interconnection between 2 adjacent posterior teeth: 9 mm²

MANUFACTURING OF THE BLOCKS

After inspection upon receipt, **SINA-Z** block is ready straight away to be used on the machine. Depending on the type of blocks, in one block it is possible to machine large assemblies or several small assemblies. By means of a clever arrangement, utilisation of **SINA-Z** block can be optimised.

Milling of the **SINA-Z** block can be done dry or in the presence of an emulsion. Do not use any cutting oil. Take into account the shrinkage factor indicated on the block (F=1.XXXX) when programming the parts.

Also, please consider the instructions included in your machine's manual.

After milling, the **SINA-Z** block must be inspected visually and must not show the following defects:

- A shiny area on the surface.
- Discolouration of the block.
- Chipping of material.
- Cracks.

If one of the defects that are mentioned above occur, the block must not be used at all for manufacturing dental restorations.

RECOMMENDED MACHINES

The **SINA-Z** can be used for all standard HSC drilling applications in dental laboratories, VHF machines manufacturer, Roeders, MB Geis, DMG, Wiesner, Imes, etc...

SINTERING

Sintering of milled parts of **SINA-Z** is performed in a furnace. For this, the thermal processing that is recommended by Simeda® must not be modified. During the sintering process, the armature shrinks to reach the required dimensions. The temperature has a significant influence on the result. It is only after sintering that the armature has the properties needed to be effective in the clinical application.

RECOMMENDED FURNACES

All the conventional programmable furnaces can be used, such as furnaces from the following manufacturers: MihmVogt, ThermoStar, Nabertherm, Heidorn, etc...

GENERAL PRECAUTIONS

The frame manufactured out of a SINA-Z must be reworked only when absolutely necessary. ANY ALTERATION CONSTITUTES A RISK OF MECHANICAL EMBRITTLEMENT OF THE PART.

Rules to be observed:

- Use a fine-grain diamond tool with high rotation speed and under abundant irrigation.
- Comply with the minimum thickness of the walls according to the general rules for a dental restorations; the wall thickness must not be less than 0.4 mm.
- Work under low pressure and do not force the machining.
- Avoid trimming the connections between the teeth.

PROPERTIES

The **SINA-Z** material's properties 3Y-TZP are given below:

Physical Properties:

Colour: White
Density: > 6.035 g/cm³
Vickers Hardness: 1250 VH
Flexural Strength: > 800 MPa
Tenacity: 7 MPa• m^{1/2}
Modulus of Elasticity: 210 GPa
Thermal expansion coefficient: 10•10⁻⁶•K⁻¹

Chemical Composition:

Chemical Substances	Chemical Formulation	CAS No.	CE No.	% in mass
Zirconium Oxide	ZrO ₂ /HfO ₂ /Y ₂ O ₃	1314-23-4	215-222-7	> 99 %
Hafnium Oxide	HfO ₂	12055-23-1	235-013-2	≤ 5 %
Yttrium Oxide	Y ₂ O ₃	1314-36-9	215-233-5	> 4,5 to <5,4 %
Aluminium Oxide	Al ₂ O ₃	344-28-1	215-691-6	≤ 0,5 %
Other Oxides	-	-	-	≤ 0,5 %

AVAILABLE GEOMETRIC FORMS

SINA-Z blocks are currently available in several shapes and thicknesses:

Discs measuring 98.5 mm in diameter with thicknesses of 10 mm, 14 mm, 16 mm, 18 mm, 20 mm, 22 mm and 25 mm.

Square blocks measuring 116 mm x 116 mm and 92 mm x 92 mm.

Other sizes and thickness can be made available upon request.

VENEERING

Different veneering trials were very conclusive occurred by using: HeraCeram, VITA VM 9, Heimerle and Meule.

RECOMMENDED SINTERING SCHEDULE

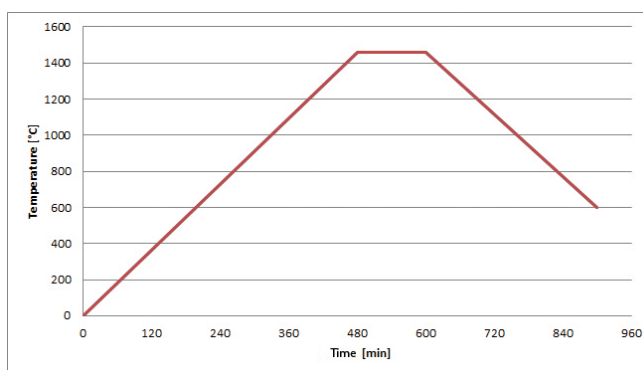
The sintering schedule must not be changed significantly, because this could affect the mechanical properties. Sintering is generally performed in an electric furnace.

Programming the kiln:

Start at room temperature with ramp of 3-4 K/min until reaching 1,460°C; maintain this temperature for 2 hours, then reduce the temperature with a ramp of 3-4 K/min until reaching room temperature. Depending on the type of furnace, natural cooling begins from approximately 600°C.

CAUTION

Do not open the furnace when it is hot - thermal shock could lead to irreversible damage.



SAFETY, LIABILITY

The proper use and handling of this product without our supervision are entirely under the responsibility of the user.

ANTHOGYR-Simeda thanks you for your trust and is available if you need any additional information.